

SCOPE OF WORK

Energy Audit & Cogeneration (CHP) Feasibility Study

Trenton Psychiatric Hospital & Ann Klein Forensic Center
Trenton, Mercer County, N.J.

PROJECT NO. A1241-00

STATE OF NEW JERSEY

Honorable Chris Christie, Governor
Honorable Kim Guadagno, Lt. Governor

DEPARTMENT OF THE TREASURY

Ford M. Scudder, Acting Treasurer



DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

Steven Sutkin, Director

Date: May 17, 2016

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I. OBJECTIVE

The objective of this project is to conduct a comprehensive Energy Audit of Trenton Psychiatric Hospital and Ann Klein Forensic Center to identify potential Energy Conservation Measures (ECM's), the projected savings of each ECM, and the cost to implement each ECM. The report will be the first phase of an Energy Savings Improvement Plan per N.J.S.A. 52:34-25.

In addition, the Consultant shall identify and evaluate any viable renewable/distributed energy technologies for the joint facilities including a comprehensive feasibility study for a new Cogeneration Combined Heat and Power (CHP) plant.

II. CONSULTANT QUALIFICATIONS

The Consultant shall be a firm pre-qualified with the Division of Property Management & Construction (DPMC) in the P051 Energy Auditing Discipline and have in-house capabilities or Sub-Consultants pre-qualified with DPMC in the P025 Estimating/Cost Analysis Discipline and all other Architectural, Engineering and Specialty Disciplines necessary to complete the project as described in this Scope of Work (SOW).

The firm shall also demonstrate that they have previous experience in conducting energy audits of other campus type facility infrastructure, similar in size and scope to this project.

III. PROJECT COST ESTIMATE

The Consultant shall estimate all costs associated with the recommendations made in the Energy Audit and Cogeneration (CHP) Feasibility Study, including but not limited to, construction costs, design and construction administration fees, affirmative action, DPMC management fees, construction management services, building commissioning, monitoring fees, testing and survey services, inspection fees, contingencies, permits, allowances, and escalation factors for the anticipated construction year(s) of the improvements.

The cost estimate shall be adjusted for items including, but not limited to premium time, construction phasing, regional location, site environmental factors, weather conditions, restrictions regarding the contractor's use of the premises, imposed constraints caused by Client Agency program schedules or building occupants, temporary relocation and moving costs, demolition costs, removal of hazardous materials, location of work within the buildings, maximum security issues, utility interruption and shut down constraints caused by building use, and concurrent construction activities with other projects at the facility.

IV. PROJECT SCHEDULE

A. SCOPE OF WORK DESIGN & CONSTRUCTION SCHEDULE

The following schedule identifies the estimated design and construction phases for this project and the estimated durations.

PROJECT PHASE	ESTIMATED DURATION (Calendar Days)
1. Project Commencement Phase	7
2. CHP Draft Phase (50% Completion)	21
• <i>Project Team & DPMC Review & Comment</i>	<i>7</i>
3. CHP Final Phase (100% Completion)	21
• <i>Project Team & DPMC Review & Approval</i>	<i>7</i>
4. Energy Audit Draft Phase (50% Completion)	35
• <i>Project Team & DPMC Review & Comment</i>	<i>14</i>
5. Energy Audit Final Phase (100% Completion)	21
• <i>Project Team & DPMC Review & Approval</i>	<i>7</i>

NOTE: The CHP and Energy Audit tasks can proceed concurrently.

B. CONSULTANT'S PROPOSED PROJECT SCHEDULE

The Consultant shall submit a Gantt chart schedule with their technical proposal that reflects their projected schedule to perform the Energy Audit and Cogeneration (CHP) Feasibility Study described in this Scope of Work. The schedule shall include overall task phases above including review and approval periods. Additional tasks should include at a minimum data logger installation, building survey, lighting survey, envelop survey, HVAC evaluation, motor evaluation, process energy use survey, data logger collection, data analysis, ECM Evaluation, demand response evaluation, presentation of draft report, review of draft report, presentation of final report, DOE-2 Energy Modeling schedule, and approval of final report.

This schedule will be reviewed by the Consultant Selection Committee as part of the evaluation process and will be assigned a score commensurate with the information provided.

PROJECT NAME: Energy Audit & Cogeneration (CHP) Feasibility Study
PROJECT LOCATION: Trenton Psychiatric Hospital and Ann Klein Forensic Center
PROJECT NO: A1241-00
DATE: May 17, 2016

V. PROJECT SITE LOCATION & TEAM MEMBERS

A. PROJECT SITE ADDRESS

The location of the project sites are:

Trenton Psychiatric Hospital
100 Sullivan Way
Trenton, New Jersey 08628

Ann Klein Forensic Center
1609 Stuyvesant Ave.
West Trenton, NJ 08628

See **Exhibit 'A'** for the project site map.

B. PROJECT TEAM MEMBER DIRECTORY

The following are the names, addresses, and phone numbers of the Project Team members.

1. DPMC Representative:

Name: William Golubinski, Manager – Energy Initiatives Unit
Address: Division of Property Management & Construction
20 West State Street, 3rd Floor
Trenton, NJ 08608-1206
Phone No: (609) 292-5210
E-Mail No: william.golubinski@treas.nj.gov

2. Department of Human Services:

Name: Katherine Fling, Director of Construction
Address: Department of Human Services
Trenton, New Jersey 08625
Phone No: (609) 292-0397
E-Mail No: Katherine.Fling@DHS.state.nj.us

3. New Jersey Board of Public Utilities:

Name: Michael Thulen, ESIP Coordinator
Board of Public Utilities
Address: 44 South Clinton Avenue
Trenton, New Jersey 08625-0350
Phone No: (609) 777-3338
E-Mail No: michael.thulen@bpu.state.nj.us

VI. PROJECT DEFINITION

A. BACKGROUND

Trenton Psychiatric Hospital (TPH) opened May 15, 1848, for the purpose of treating NJ citizens diagnosed with a mental illness. Located north of Trenton on the border of Trenton and Ewing Township, the 260 acre TPH campus has over 106 structures with many being over 75 years old. The hospital presently has a capacity of 376 beds and about 1,400 staff members over a three shift schedule (24/7).

The majority of the buildings are heated via steam produced at a central power plant.

The Ann Klein Forensic Center is a separate secure building located on the grounds of the Trenton Psychiatric Hospital. Constructed in 1994, the Ann Klein Forensic Center (AKFC) is a 250-bed psychiatric hospital serving a unique mentally ill population that requires a highly secured environment. The facility provides residential care and treatment to individuals suffering from mental illness who are committed to the facility through the court system.

Utilities provided from a central power plant location include electrical service (from Public Service Electric & Gas) and steam (high & low pressure) from gas fired boilers (gas supply from PSE&G).

Both facilities are enrolled in the NJ Consolidated Energy Savings Program for 3rd party energy supply.

VII. CONSULTANT RESPONSIBILITIES

The information provided in this section of the Scope of Work is intended as a guide for the Consultant to understand the overall basic objective of the Energy Audit and Cogeneration (CHP) Feasibility Study for this project. The Consultant is expected to use their professional judgment to include items that may not be listed and that will demonstrate major energy savings for the facility and identify the technical, economic, and environmental benefits of a cogeneration combined heat and power plant.

A. PROJECT COMMENCEMENT

Prior to the start of the Energy Audit and Cogeneration (CHP) Feasibility Study, the Consultant shall meet with the members of the Project Team to obtain and/or coordinate the following information:

This time is to be accounted for in the Project Commencement Phase. Anticipate two meetings with the project team on-site.

1. Scope of Work Review:

Conduct a meeting with the Project Team members and approved facility representatives to discuss the objective of the project scope of work, the project schedule, and the procedures that will be used by the Consultant to inspect the buildings, equipment, systems, and facility infrastructure for the Energy Audit and Cogeneration (CHP) Feasibility Study. Request necessary data (energy bills, maintenance records, major equipment inventory including which equipment specific data, building plans, list of maintenance staff (by titles and qualifications only). The State utilizes an energy tracking and bill management system from which this data can be retrieved.

2. Site Visit Policies:

Review the “Trenton Psychiatric Hospital General Contractor Regulations and Ann Klein Forensic Center Site Policies” with the Project Team and edit the document so that it is specific to this project and add any additional special security and policy requirements that must be followed during all work conducted at the facility. See **Exhibit ‘F’**, 1 page, for a copy of the TPH Contractor Regulations and **Exhibit ‘G’**, 1 page, for a copy of the AKFC Contractor Requirements.

Develop a project directory that identifies the name and phone numbers of key designated representatives of the facility that must be contacted to arrange the project site visits and building inspections.

Review the contractor regulations and requirements documents with all personnel that will be conducting the Energy Audit and Cogeneration (CHP) Feasibility Study to ensure they comply with the rules and regulations of the facilities.

3. Existing Documentation:

The following documentation will be provided to the awarded consultant:

- a. DPMC Project #M1404-00 McCray Building Utility Relocation
 - b. DPMC Project #M1347-00 Powerhouse Boiler Burner Replacement
 - c. Ann Klein Forensic Center (1995) As-Built.
 - d. DPMC Project #M513 (1984) Boiler House Repairs
 - e. DPMC Project #M435 (1982) Lighting Replacement
 - f. DPMC Project #M1161 (1994) Steam Line Replacement
-

- g. CD containing the past two years of utility billing data and relevant project data.

Review these documents and any additional information that may be provided at a later date such as reports, studies, surveys, equipment manuals, as-built drawings, etc. The State does not attest to the accuracy of the information provided and accepts no responsibility for the consequences of errors by the use of any information and material contained in the documentation provided. It shall be the responsibility of the Consultant to verify the contents and assume full responsibility for any determination or conclusion drawn from the material used. If the information provided is insufficient, the Consultant shall take the appropriate actions necessary to obtain the additional information required.

All original documentation shall be returned to the provider at the completion of the project.

B. COGENERATION (CHP) FEASIBILITY STUDY

The objective of the Cogeneration Combined Heat & Power Feasibility Study is to assess the technical and economic viability of constructing and operating a new cogeneration facility onsite and determine if it meets the requirements of the NJ Energy Master Plan and Policy on Energy Resiliency strategy to increase energy efficiency and reduce energy consumption, cost and resiliency. Items to review shall include, but not be limited to the following:

1. Determine and Evaluate the Facilities Energy Profile:

Compare current and projected electricity consumption, with and without implementation of the recommended ECM's.

Compare current and projected heating and cooling requirements, with and without implementation of the recommended ECM's.

Identify the facility thermal/electric load ratio throughout a typical year.

2. Cogeneration (CHP) Facility Design & Configuration:

Provide the location of the CHP Plant, including the utilities (electric, gas, etc.) tie-in locations. Include a summary of the recommended prime mover type, fuels, heat recovery method, etc. at a schematic level. The consultant shall also identify any regulatory or environmental constraints that will be vetted by the ESCO (separate contract).

A summary of all potential State, Federal, and Utility funded energy rebates, tax incentives, reimbursements, third party energy sharing or purchase agreements, cost savings, etc. shall be provided.

3. Cost Analysis:

Determine the construction costs of the cogeneration facility based on the recommended facility type.

Investigate the purchase, lease, or other potential funding options available to finance the project. Determine the operating and maintenance costs of the cogeneration facility.

Provide a CHP Plant construction cost estimate, including details of sub metering for measurement and verification.

Determine the operating and maintenance costs of the CHP Plant.

Perform an economic evaluation and simple payback of the cogeneration facility to determine if the project is financially viable, using fuel and grid electricity price projection that are provided state contract rates in effect through the NJ Consolidated Energy Savings Program.

Assess the economic and financial risks associated with the proposed new cogeneration facility.

4. Evaluation of Cogeneration (CHP) Facility Performance:

Describe the methods to evaluate the cogeneration plant performance after construction to ensure it meets the guarantees of the design specifications. Recommend measurement and verification protocol options best suited to evaluate specific technology determined to be the best fit for these facilities (IPMVP options A thru D).

C. COGENERATION (CHP) FEASIBILITY STUDY REPORT

Based on the results of the Cogeneration (CHP) Feasibility Study findings, the Consultant shall prepare a bound 8 1/2" x 11" Cogeneration (CHP) Feasibility Study Report that incorporates the following elements:

1. Table of Contents:

Provide a table of contents and page numbers for the Cogeneration (CHP) Feasibility Study Report.

2. Executive Summary:

Include a brief description of the Cogeneration (CHP) Feasibility Study objective and the overall conclusions and recommendations for each item reviewed in the outline above including justifications for the selections made.

3. Building & Equipment Information:

Provide a general description of the cogeneration (CHP) facility and the prime mover, electricity generator, heat recovery system, control automation systems, operational profiles, and schedules of all mechanical and electrical equipment to be installed and how they will operate. Include a schematic one line diagram showing the mechanical & electrical equipment, system infrastructure, etc. in the cogeneration facility.

At a schematic level, describe the coordination requirements needed to construct the new cogeneration facility, tie into the existing or new infrastructure, and operate the existing powerhouse equipment, systems and infrastructure during construction.

Describe redundancy capabilities and requirements for plant downtime (incorporated n+1 redundancy, grid power, rental generators/boilers or other solutions as recommended)

4. Energy Savings Summary:

Provide an economic analysis of the new cogeneration (CHP) facility including all appropriate accounting information, selected charts and graphs, etc. that will demonstrate the anticipated overall life cycle cost savings of the new facility. Items shall include, but not be limited to:

Estimated construction costs, including cost of all equipment and materials, and source of cost estimate.

Estimated energy savings (in energy specific volume units and total MMBTU's).

Estimated annual energy cost savings based on historical energy costs of the facility and projected fuel costs, which will be determined in consultation with DPMC.

Estimate of any rebates/financial incentives available through New Jersey's Clean Energy Program, the NJ Economic Development Authority, the federal government, or from other sources.

Estimated annual operating cost savings, including reductions in maintenance expenses, demand reduction/management as well as demand response revenue .

Estimated lifetime energy cost savings.

Simple payback and return on investment.

Options for funding the installation of recommended measures.

5. Cost Estimates:

All costs shall be estimated and presented in CSI format (2004) in an appendix of the report. Each cost estimate shall include:

Narrative explanation of the work, including diagrammatic sketches if required to explain the work.

List of assumptions made in compiling the estimate.

Cost of demolition of existing systems (if required).

Cost of impact of facility operations on the construction of the new cogeneration (CHP) facility (work restrictions).

See Section III of this Scope of Work for additional cost estimating information.

6. Cogeneration (CHP) Feasibility Study Report Copies:

Provide 6 copies of the Cogeneration (CHP) Feasibility Study Report at each phase of the project to the Project Manager. Also provide 2 CD disks of the final approved report in .PDF format, the contents with any drawings in “.dwg” (native file format for AutoCAD) and “.pdf” (Adobe Portable Document Format) file formats for photos.

D. ENERGY AUDIT

1. Data Gathering Coordination:

The Consultant shall meet with the Project Team members and approved representatives of the facility to develop an approved schedule and times to access each building, identify the areas and equipment that will be inspected, describe the methods and equipment that will be used to acquire needed data, the number of interviews to be conducted, and the duration of each building inspection.

Surveys, measurements, photographs and other data collection methods shall be performed in such a way as to minimize disruption to the building occupants. Consider the use of aerial infrared photography to survey underground steam and chilled water lines and building

envelopes. A structured interview process shall be used to determine existing equipment, utilities, maintenance, and operation issues for the building.

The consultant will be responsible to provide baseline energy data on a per-building basis. Where electrical meters do not exist, sub-meters w/data logging capability are to be installed to gather necessary data per the unit cost on the fee proposal form. (Install, monthly rental rate, multiple types of meters?)

Note: Provide a unit cost per sub-meter including installation, removal and monthly rental rate for all energy utilities including but not limited to electrical, heating hot water, chilled water and steam. See Exhibit ‘H’.

It may be in the State’s best interest to install permanent sub-metering on some utilities, including but not limited to electrical, heating hot water, chilled water and steam. Consultant shall prepare the necessary plans and specifications to have these installations competitively bid by DPMC. Consultant shall provide a cost estimate for the sub-metering installations with the plans and specifications for review prior to bids being solicited. The cost to prepare the necessary plans and specifications and cost estimate shall be included in the consultants lump sum bid.

A one week “look ahead” schedule shall be provided to the facility representatives for review and approval prior to each building inspection.

Note: The Consultant is responsible for protecting the images and information collected and preventing its’ disclosure to unauthorized personnel. Individual site requirements will be discussed at the Consultant Pre-bid meeting.

2. Building, Equipment and Systems Profile:

Provide the name and number for each building, the year of original building construction and any building additions, and building square footage.

Characterize the building usage, type of construction, occupancy profiles, construction features including a description of the building envelope.

Provide a detailed inventory and descriptive narrative for all building energy consuming equipment including an estimate of their energy consumption, efficiency, and remaining useful life. Items shall include, but not be limited to boilers and furnaces, cooling systems, chillers, energy recovery systems, heating systems, ventilation systems, domestic hot water heaters, meters, automatic control systems, energy management systems, electrical systems and lighting, data centers, motors, manual controls, etc.

Review all aspects of interdependency or contingency of equipment and/or controls so that recommended ECM's are assured of compatibility with other elements of the structure and systems.

Assess how the various building systems and equipment are set-up, their actual operating conditions, and the control methods used to manage the systems. Provide colored photographs of the equipment and systems inspected.

Evaluate the building envelope for energy consumption, including but not limited to the roof and walls, insulation, external windows, and doors.

Evaluate the operation, maintenance, and testing programs for the building equipment.

3. Measurements & Observations:

Provide specific measurements such as temperature, relative humidity, light levels, air flows, etc. where appropriate. Also, relevant observations shall be noted such as damper positions, operating deficiencies, control settings, damaged equipment, maintenance shortfalls, etc.

4. Facility Energy Profile:

The annual facility energy use and peak demand for each energy type shall be reported. This shall include annual consumption, cost, and greenhouse gas emissions associated with each energy type. This information shall be supplied in the sample Facility Energy Profile Table format provided in **Exhibit 'D'**.

E. ENERGY AUDIT REPORT

Based on the results of the Energy Audit findings, the Consultant shall prepare a bound 8 1/2" x 11" Energy Audit Report that incorporates the following elements:

1. Table of Contents:

Provide a table of contents and page numbers for the Energy Audit Report.

2. Executive Summary:

Include a brief introduction to the facility and a description of the project objective and overall conclusions and recommendations of the Energy Audit.

3. Building/Facility Information:

Provide a general background description of the facility, building components, mechanical systems, electrical systems, automation systems, and operational profiles and schedules. A description of the building envelope (windows, doors, insulation, etc.), age and construction history, number of employees, occupancy patterns, and a discussion of the O&M program shall be included.

The building information section shall also contain relevant photos of the facility, buildings, and mechanical systems, a description of energy types used, and a description of the primary mechanical systems and controls.

4. Equipment List:

Provide a detailed inventory of equipment, which contains pertinent information for all energy consuming equipment including estimate of equipment efficiency and remaining useful life. For example, for lighting, for each area of each building, provide existing fixture type, existing lamp type, existing lamp count and existing ballast type, current watts per fixture and current energy cost per room/building. Similar detail should be provided for other equipment.

5. Utility Summary:

Provide energy accounting information for a minimum of one year, as well as selected charts and graphs that will demonstrate the overall energy demand trend and usage patterns of the facility or building. Provide site plan indicating one-line utility distribution and meter locations.

6. Historic Energy Consumption:

Compile energy usage and costs for each facility/building for the twelve months prior to the audit including kW, kWh, BTUs, therms, etc. and shall include billing meter readings that corroborate usage.

Identify the utility rate schedule under which services are provided to each meter.

Enter the required building and utility data into the U.S. Environmental Protection Agency's (EPA) Portfolio Manager energy benchmarking system. Note the EPA Score for each building, and provide the information necessary to access the Portfolio Manager account.

7. Energy Conservation Measures:

Provide a narrative summary for each recommended ECM that meets the objective of this project scope of work. Clearly document the key assumptions made in analyzing each measure and describe the method of analysis. Calculations are to be supported by DOE-2 Energy Modeling Software.

Provide the estimated cost, estimated savings, simple payback, and other data for each ECM in the required Energy Conservation Measure Summary Format Table depicted in **Exhibit 'E'**. The description of each ECM shall also include the following information following this Energy Conservation Measure Summary Format Table:

A one or two page description of each ECM and supporting calculations. Identify complimentary measures that when combined produce a result more beneficial than if either is employed independently.

No-cost measures such as adjusting equipment, control systems, or schedules shall be addressed first.

Energy use and savings calculations and economic analysis.

Assumptions that were made regarding operation or equipment efficiency.

Estimated installation cost, including cost of all equipment and materials, and source of cost estimate.

Estimated energy savings (in energy specific volume units and total MMBTU's).

Estimated annual energy cost savings based on current historical energy costs of the facility.

Estimate of any rebates/financial incentives available through New Jersey's Clean Energy Program or from other sources.

Estimated annual operating cost savings, including reductions in maintenance expense.

Estimated lifetime energy cost savings.

Simple payback.

Options for funding the installation of recommended measures.

Identify minimum and suggested equipment standards that must be used in the design, procurement, and installation of all ECM's such as ASHRAE 90.1, ASHRAE 155P for Commercial Boiler Efficiency, etc.

8. Renewable/Distributed Energy Measures:

Recommend any viable renewable/distributed energy technologies, including solar power, wind power, geothermal systems, etc. which could be cost effectively implemented for the facility. Identify available grants, incentives and/or sources of funding. Provide an analysis of costs and savings comparing current and future costs of electric and thermal energy with and without each technology assessed.

9. Energy Purchasing and Procurement Strategies:

For each facility develop a load profile for each electric and natural gas account. Provide an analysis of the utility tariff under which the facility is currently served. Assess potential savings from purchasing from third party suppliers.

10. Energy Audit Report Copies:

Provide 6 copies of the Energy Audit Report at each phase of the project to the Project Manager. Also provide 2 CD disks of the final approved report (.pdf) and all of the contents with any drawings in “.dwg” (native file format for AutoCAD) and “.pdf” (Adobe Portable Document Format) file formats. Include a copy of the DOE-2 Energy Modeling Software file.

F. MEETINGS & PRESENTATIONS

1. Meetings:

Conduct the appropriate number of review meetings with the Project Team members during each phase of the project so they may determine if the project meets their requirements and make changes where appropriate. Selected studies, sketches, cost estimates, schedules, and other relevant information shall be presented to support the recommendations proposed.

It shall also be the responsibility of the Consultant to arrange and require all critical Sub-Consultants to be in attendance at the meetings.

2. Presentations:

The minimum number of presentations required for each phase of this project is identified below for reference:

Preliminary Energy Audit and Cogeneration CHP Feasibility Study Phase (50% Completion):
One (1) oral presentation at the phase completion.

Final Energy Audit and Cogeneration CHP Feasibility Study Phase (100% Completion): One (1) oral presentation at the phase completion.

G. SUB-CONSULTANT PARTICIPATION

It is the responsibility of the Consultant to ensure that they have provided adequate hours and/or time allotted in their technical and fee proposal so that their Sub-Consultants may participate in all appropriate phases and activities of this project. This includes the pre-proposal site visit and the various meetings and site visits described in this Scope of Work. All costs associated with such services shall be included in the base bid of the Consultant's fee proposal.

VIII. GENERAL REQUIREMENTS

A. SCOPE CHANGES

The Consultant must request any changes to this Scope of Work in writing. An approved DPMC 9d Consultant Amendment Request form reflecting authorized scope changes must be received by the Consultant prior to undertaking any additional work. The DPMC 9d form must be approved and signed by the Director of DPMC and written authorization issued from the Project Manager prior to any work being performed by the Consultant. Any work performed without the executed DPMC 9d form is done at the Consultant's own financial risk.


PROJECT NAME: Energy Audit & Cogeneration (CHP) Feasibility Study
PROJECT LOCATION: Trenton Psychiatric Hospital and Ann Klein Forensic Center
PROJECT NO: A1241-00
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IX. SOW SIGNATURE APPROVAL SHEET

This Scope of Work shall not be considered a valid document unless all signatures appear in each designated area below.

The Client Agency approval signature on this page indicates that they have reviewed the design criteria and construction schedule described in this project Scope of Work and verifies that the work will not conflict with the existing or future construction activities of other projects at the site.

SOW APPROVED BY:


JAMES MCKENNA, MANAGER
DRMC PROJECT PLANNING & INITIATION

5/17/16

DATE

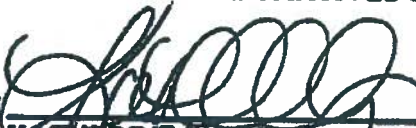
SOW APPROVED BY:


WILLIAM GOLUBINSKI, MANAGER
DPMC ENERGY INITIATIVES UNIT

5/20/16

DATE

SOW APPROVED BY:


KATHERINE FLING, DIR. OF CONSTRUCTION
DEPARTMENT OF HUMAN SERVICES

6-24-16

DATE


SOW APPROVED BY:


MICHAEL THULEN, ESIP COORDINATOR
NEW JERSEY BOARD OF PUBLIC UTILITIES

7/6/2016

DATE

SOW APPROVED BY:


RICHARD FLODMAND, DEPUTY DIRECTOR
DIV PROPERTY MGT & CONSTRUCTION

7/8/16

DATE

X. CONTRACT DELIVERABLES

The following is a listing of Contract Deliverables that are required at the completion of each phase of this project.

PROJECT COMMENCEMENT

Meetings & Minutes (Minutes within 5 working days of meeting)

Correspondence

Project Commencement

SOW Review

Site Visit Policies, Contractors Use of the Premises, Project Directory

Collect Existing Documentation

COGENERATION CHP FEASIBILITY STUDY (ALL PHASES)

Meetings & Minutes (Minutes within 5 working days of meeting)

Correspondence

Cogeneration CHP Feasibility Study Submission Requirements

Determine and Evaluate the Energy Consumption Profile

Cogeneration Facility Design & Configuration

Regulation Authority Coordination

Cogeneration Facility Space Requirements

Cogeneration Facility Operation

Cost Analysis

Evaluation of Cogeneration Facility Performance

Cogeneration CHP Feasibility Study Report

Table of Contents

Executive Summary

Building & Equipment Information

Energy Savings Summary

Cost Estimates in CSI Format & Cost Analysis 38 Form

PROJECT NAME: Energy Audit & Cogeneration (CHP) Feasibility Study
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Cogeneration CHP Feasibility Study Report: 6 sets each submission
Diagrammatic Sketches/Drawings if appropriate: 6 hardcopy sets and on disc in
“.dwg” (native file format for AutoCAD and “.pdf” (Adobe Portable Document
Format) file formats.
Bar Chart of Cogeneration Feasibility Study Schedule
Oral Presentation of Submission to Project Team (Oral Presentation @25%, 90%,
100% w/6 sets of Cogeneration Feasibility Study each submission)
SOW Compliance Statement
This Submission Checklist
Deliverables Submission in Booklet Form: 6 sets

Approval of Submission

Respond to Submission Comments

ENERGY AUDIT (ALL PHASES)

Energy Audit Submission Requirements

Data Gathering Coordination
Building, Equipment & Systems Profile
Measurements & Observations
Facility Energy Profile

Energy Audit Report Submission Requirements

Table of Contents
Executive Summary
Building/Facility Information
Equipment Lists
Utility Summary
Historic Energy Consumption
Energy Conservation Measures
Renewable/Distributed Energy Measures
Energy Purchasing and Procurement Strategies
Cost Estimates in CSI Format & Cost Analysis 38 Form
Energy Audit Report: 6 sets each submission
Diagrammatic Sketches/Drawings if appropriate: 6 hardcopy sets and on disc in
“.dwg” (native file format for AutoCAD and “.pdf” (Adobe Portable Document
Format) file formats.
Bar Chart of Energy Audit Schedule

PROJECT NAME: Energy Audit & Cogeneration (CHP) Feasibility Study
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Oral Presentation of Submission to Project Team (Oral Presentation @25%, 90%, 100%
w/6 sets of Energy Audit each submission)
SOW Compliance Statement
This Submission Checklist
Deliverables Submission in Booklet Form: 6 sets

Approval of Submission

Respond to Submission Comments

PROJECT CLOSE-OUT PHASE

Include one on-site meeting with DPMC for final deliverables, all reproduction material, and review for closeout documentation.

Responsibilities: Plan, Schedule and Execute Close-Out Activities

Commencement: Initiate Close-Out w/DPMC 20A Project Close-Out Form

Determination of Substantial Completion

Initiation of Final Contract Acceptance Process

Final Payment

A/E Invoice and Close-Out Forms for Final Payment

Final Performance Evaluation of the A/E

PROJECT NAME: Energy Audit & Cogeneration (CHP) Feasibility Study
PROJECT LOCATION: Trenton Psychiatric Hospital and Ann Klein Forensic Center
PROJECT NO: A1241-00
DATE: May 17, 2016

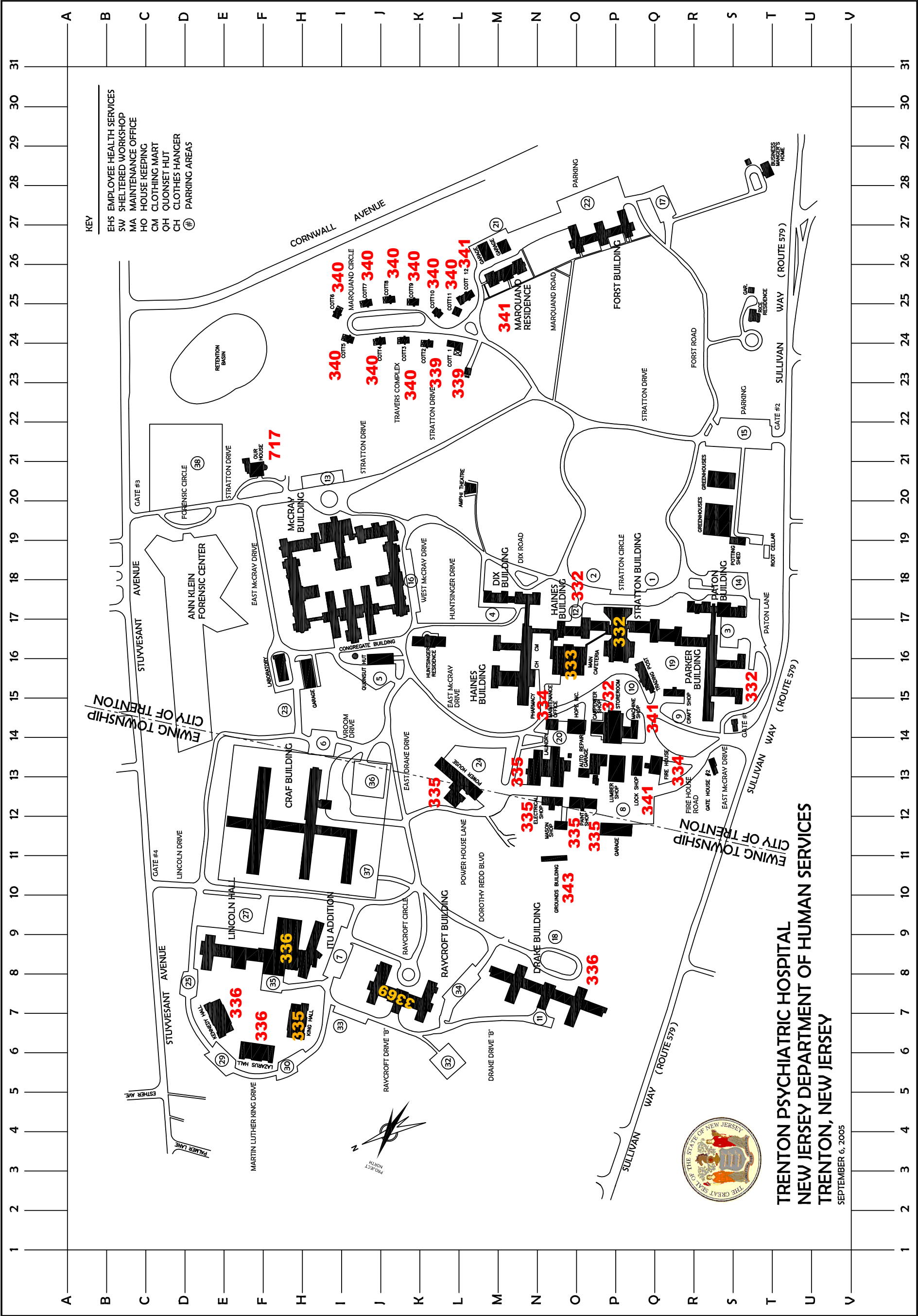
XI. EXHIBITS

The attached exhibits in this section will include a sample project schedule, and any supporting documentation to assist the Consultant in the design of the project such as maps, drawings, photographs, floor plans, studies, reports, etc.

- A. Trenton Psychiatric Hospital/Ann Klein Forensic Center Site Map.
- B. List of buildings to be included in this study.
- C. List of study buildings showing occupancy numbers and times.
- D. Facility Energy Profile Table.
- E. Energy Conservation Measure Summary Format Table.
- F. Trenton Psychiatric Hospital General Contractor Regulations
- G. Ann Klein Forensic Center Contractor Requirements
- H. Unit Costs for Energy Meters to be Used in Energy Audit

END OF SCOPE OF WORK

EXHIBIT 'A'



TRENTON PSYCHIATRIC HOSPITAL BUILDINGS TO BE INCLUDED IN ENERGY AUDIT

BUILDING ID NUMBER AND NAME	SQ. FT.	PSE&G ACCOUNT #	METER #
3328-TRENTON PSYCH-Haines (E.Main) 1st floor	100286	4200105209	778017295
3325-TRENTON PSYCH-Parker	92246	4200105209	778017295
3362-TRENTON PSYCH-Lincoln Bldg.	58413	4215451906	6548288106
3324-TRENTON PSYCH- Stratton	55971	4200105209	778017295
3369-TRENTON PSYCH-Raycroft	52068	4215451906	778017295
3367-TRENTON PSYCH-Drake	50413	4200105209	778017295
3412-TRENTON PSYCH-Marquand Bldg.	17929	6584401901	
3356-TRENTON PSYCH-Powerhouse	15588	4215451906	
3351-TRENTON PSYCH HOSP-Laundry Bldg.	15274	4200105209	778017295
3360-TRENTON PSYCH HOSP-Lazarus	14881	4200105209	778017295
3337-TRENTON PSYCH HOSP-Main Cafeteria/bakery	13340	4215451906	
3359-TPH (DMHH)-King Cottage	11351	4200105209	778017295
3361-TRENTON PSYCH-Kennedy Cottage	11351	4200105209	778017295
3415-TRENTON PSYCH-Trading Post	5780	4200105209	778017295
3346-TRENTON PSYCH-Firehouse	5734		
3345-TRENTON PSYCH - Maintenance Office	3290	4200105209	778017295
3396-TRENTON PSYCH-T.L.U. #1	2798	6754229209	
3416-TRENTON PSYCH-Lock Shop / Garages	2698		
3354-TRENTON PSYCH-Electric Shop	2464	4200105209	778017295
3439-TRENTON PSYCH-Grounds Shop	2000		
3436-TRENTON PSYCH-Old Metal Shop	1976		
3399-TRENTON PSYCH-T.L.U. #2	1632	6613213918	
3400-TRENTON PSYCH-T.L.U. #3	1632	6613214809	
3401-TRENTON PSYCH-T.L.U. #4	1632	6584100707	
3402-TRENTON PSYCH-T.L.U. #5	1632	6638916904	
3403-TRENTON PSYCH-T.L.U. #6	1632	6607526306	
3404-TRENTON PSYCH-T.L.U. #7	1632	6739424403	
3405-TRENTON PSYCH-T.L.U. #8	1632	6551015700	
3406-TRENTON PSYCH-T.L.U. #9	1632	4200105209	
3407-TRENTON PSYCH-T.L.U. #10	1632	6757774100	
3409-TRENTON PSYCH-T.L.U. #11	1632	6739424802	
3410-TRENTON PSYCH-T.L.U. #12	1632	6712828104	
3355-TRENTON PSYCH-Mason Shop	1380		
3344-TRENTON PSYCH-Business Office	400	4215451906	
3353-TRENTON PSYCH-Paint Shop	400		
3326-TRENTON PSYCH-Carpentry	400 +/-		
3338-TRENTON PSYCH-Main Café Refrigeration	(Walk-in Boxes)		
ANNE KLEIN FORENSIC CENTER	138252	4200392100, 6716040501	

EXHIBIT 'B'

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3362-TRENTON PSYCH-Lincoln Bldg.	65794				400 400 400 400 400	M TU W TH F SAT SUN 9 AM - 5 PM
	3324-TRENTON PSYCH HOSP (DMHH)- Stratton Building	56751				70 70 70 70 70	M TU W TH F SAT SUN 9:00 AM - 5:00 PM
	3369-TRENTON PSYCH-Raycroft	52068				450 450 450 450 450 450 450	M TU W TH F SAT SUN 24-7
	3367-TRENTON PSYCH HOSP (DMHH)-Drake	50964				379 379 379 379 379 379 379	M TU W TH F SAT SUN 24-7
	3336-TRENTON PSYCH-Dix	41220					M TU W TH F SAT SUN
	3328-TRENTON PSYCH-Haines (E.Main) 15 ft	100286 25000				107 107 107 107 107	M TU W TH F SAT SUN 9 AM - 5 PM

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3325-TRENTON PSYCH-Parker <i>Parkinsons</i>	92246 21536				23 23 23 23 23 5 5	M TU W TH F SAT SUN <i>9am-500pm</i> <i>24/7</i>
	3412-TRENTON PSYCH- Marquand Bldg.	17929 21280				47 47 47 47 47 47 47	M TU W TH F SAT SUN <i>24/7</i>
	3360-TRENTON PSYCH HOSP (DMHH)-Lazarus Cottage	14880				24 24 24 24 24 24 24	M TU W TH F SAT SUN <i>3pm-9am</i> <i>Sleep</i> <i>All DAY/Night</i>
	3359-TPH (DMHH)-King Cottage	11350				27 27 27 27 27 27 27	M TU W TH F SAT SUN <i>9am-9am</i> <i>Sleep</i> <i>All DAY/Night</i>
	3361-TRENTON PSYCH-Kennedy Cottage	11350				30 30 30 30 30 30 30	M TU W TH F SAT SUN <i>3pm-9am</i> <i>Sleep</i> <i>All DAY/Night</i>
	3335-TRENTON PSYCH HOSP (DMHH)-Vegetable Room	8484					M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3348-TRENTON PSYCH HOSP (DMHH)-Lumber Shed	5626					M TU W TH F SAT SUN
	3346-TRENTON PSYCH HOSP (DMHH)-Firehouse	5734 5310				2 2 2 2 2	M TU W TH F SAT SUN
	3439-TRENTON PSYCH-Grounds Shop	4725				12 12 12 12 12	M TU W TH F SAT SUN
	3365-TRENTON PSYCH-Lab Garages	4464					M TU W TH F SAT SUN
	3372-TRENTON PSYCH-Quonset Hut	4018					M TU W TH F SAT SUN
	3382-TRENTON PSYCH HOSP (DMHH)-Greenhouse #1	3622					M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3345-TRENTON PSYCH HOSP - - - Maintenance Office	3290 3036				5 5 5 5 5	M 7-4 pm TU 7-4 pm W 7-4 pm TH 7-4 pm F 7-4 pm SAT SUN
	3355-TRENTON PSYCH-Mason Shop	2880				3 3 3 2 2	M 7-4 pm TU 7-4 pm W 7-4 pm TH 7-4 pm F 7-4 pm SAT SUN
	3416-TRENTON PSYCH-Lock Shop / Garages	2698				3 3 3 3 2	M 7-4 pm TU 7-4 pm W 7-4 pm TH 7-4 pm F 7-4 pm SAT SUN
	3396-TRENTON PSYCH HOSP (DMHH)-T.L.U. #1	2684				8 8 8 8 8 8 8 8	M TU W 24-7 TH F SAT SUN
	3391-TRENTON PSYCH HOSP (DMHH)-Garage	2113					M TU W TH F SAT SUN
	3392-TRENTON PSYCH HOSP (DMHH)-Garage	2113					M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3393-TRENTON PSYCH HOSP (DMHH)-Garage	2113					M TU W TH F SAT SUN
	3414-TRENTON PSYCH- Marquand Garage #2	2113					M TU W TH F SAT SUN
	3436-TRENTON PSYCH-Old Metal Shop	1976				4 4 4 4 4	M TU W TH F SAT SUN
	3341-TRENTON PSYCH HOSP (DMHH)-Sign Shop						M TU W TH F SAT SUN
	3399-TRENTON PSYCH-T.L.U. #2	1632				8 8 8 8 8 8 8	M TU W TH F SAT SUN
	3400-TRENTON PSYCH-T.L.U. #3	1632				8 8 8 8 8 8 8	M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3401-TRENTON PSYCH-T.L.U. #4	1632				89 89 89 89 89 89 89	M TU W TH F SAT SUN 24-7
	3402-TRENTON PSYCH-T.L.U. #5	1632				8 8 8 8 8 8 8	M TU W TH F SAT SUN 24-7
	3403-TRENTON PSYCH-T.L.U. #6	1632				8 8 8 8 8 8 8	M TU W TH F SAT SUN 24-7
	3404-TRENTON PSYCH-T.L.U. #7	1632				9 9 9 9 9 9 9	M TU W TH F SAT SUN 24-7
	3407-TRENTON PSYCH-T.L.U. #10	1632				8 8 8 8 8 8 8	M TU W TH F SAT SUN 24-7
	3409-TRENTON PSYCH-T.L.U. #11	1632				7 7 7 7 7 7 7	M TU W TH F SAT SUN 24-7

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3438-TRENTON PSYCH-Old Switch House						M TU W TH F SAT SUN
	3413-TRENTON PSYCH- Marquand Garage #1						M TU W TH F SAT SUN
	3410-TRENTON PSYCH-T.L.U. #12	1632				9 9 9 9 9 9 9	M TU W TH F SAT SUN 24-7
	3339-TRENTON PSYCH- Employee Housing						M TU W TH F SAT SUN NONE
	3443-TRENTON PSYCH-Root Cellar						M TU W TH F SAT SUN
	3408-TRENTON PSYCH-T.L.U. #10 Garage						M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3395-TRENTON PSYCH HOSP (DMHH)-Garage						M
							TU
							W
							TH
							F
							SAT
							SUN
	3397-TRENTON PSYCH HOSP (DMHH)-T.L.U. #1 Garage						M
							TU
							W
							TH
							F
							SAT
							SUN
	3370-TRENTON PSYCH-Garage Ray						M
							TU
							W
							TH
							F
							SAT
							SUN
	3398-TRENTON PSYCH-T.L.U. #1 Car Port						M
							TU
							W
							TH
							F
							SAT
							SUN
	3331-TRENTON PSYCH HOSP (DMHH)-McCray						M
							TU
							W
							TH
							F
							SAT
							SUN
	3332-TRENTON PSYCH HOSP (DMHH)-McCray						M
							TU
							W
							TH
							F
							SAT
							SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3333-TRENTON PSYCH HOSP (DMHH)-McCray						M TU W TH F SAT SUN
	3337-TRENTON PSYCH HOSP (DMHH)-Main Cafe	13340				20 20 20 20 20 20 20	M TU W TH F SAT SUN 4:30 PM - 6:30 PM
	3340-TRENTON PSYCH HOSP (DMHH)-Employee Housing						M TU W TH F SAT SUN N/A
	3342-TRENTON PSYCH-Maint ---Shops---						M TU W TH F SAT SUN
	3344-TRENTON PSYCH HOSP (DMHH)-Bakery Business office					5 5 5 5 5	M TU W TH F SAT SUN 9 AM - 5:00 PM
	3349-TRENTON PSYCH-Auto Repair						M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3350-TRENTON PSYCH HOSP (DMHH)-PATON BLDG						M TU W TH F SAT SUN
	3351-TRENTON PSYCH HOSP (DMHH)-Laundry Bldg.					7 7 7 7 7	M TU W TH F SAT SUN <i>6:30 am 4:00 pm</i>
	3353-TRENTON PSYCH-Paint Shop					7 7 7 7 7	M TU W TH F SAT SUN <i>7:30 am 4 pm</i>
	3354-TRENTON PSYCH-Electric Shop					7 7 7 7 7	M TU W TH F SAT SUN <i>7:30 am 4 pm</i>
	3356-TRENTON PSYCH- Powerhouse					3 3 3 3 3 3 3	M TU W TH F SAT SUN <i>24/7</i>
	3357-TRENTON PSYCH-Paton Bldg (vacant)						M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3364-TRENTON PSYCH HOSP (DMHH)-Old Laboratory						M
							TU
							W
							TH
							F
							SAT
							SUN
	3374-TRENTON PSYCH- Huntingger						M
							TU
							W
							TH
							F
							SAT
							SUN
	3375-TRENTON PSYCH HOSP (DMHH)-Congregate						M
							TU
							W
							TH
							F
							SAT
							SUN
	3376-TRENTON PSYCH HOSP (DMHH)-Transformer Vault (Cong)						M
							TU
							W
							TH
							F
							SAT
							SUN
	3379-TRENTON PSYCH HOSP (DMHH)-AmphiTheater						M
							TU
							W
							TH
							F
							SAT
							SUN
	3380-TRENTON PSYCH HOSP (DMHH)-Swimming Pool HUse						M
							TU
							W
							TH
							F
							SAT
							SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3381-TRENTON PSYCH- Greenhouse Work Station						M TU W TH F SAT SUN
	3383-TRENTON PSYCH HOSP (DMHH)-Greenhouse #2						M TU W TH F SAT SUN
	3385-TRENTON PSYCH HOSP (DMHH)-Rice House						M TU W TH F SAT SUN
	3386-TRENTON PSYCH HOSP (DMHH)-Rice Garage						M TU W TH F SAT SUN
	3387-TRENTON PSYCH HOSP (DMHH)-Rice Transformer						M TU W TH F SAT SUN
	3388-TRENTON PSYCH HOSP (DMHH)-Old Business Manager One House?						M TU W TH F SAT SUN

N/A

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3390-TRENTON PSYCH HOSP (DMHH)-Fore Bldg.						M
							TU
							W
							TH
							F
							SAT
							SUN
	3431-TRENTON PSYCH- Employees						M
							TU
							W
							TH
							F
							SAT
							SUN
	3432-TRENTON PSYCH- Employees						M
							TU
							W
							TH
							F
							SAT
							SUN
	3433-TRENTON PSYCH- Employees						M
							TU
							W
							TH
							F
							SAT
							SUN
	3437-TRENTON PSYCH-						M
							TU
							W
							TH
							F
							SAT
							SUN
	3338-TRENTON PSYCH HOSP (DMHH)-Main Cafe Refrig	Walk-in Boxes					M
							TU
							W
							TH
							F
							SAT
							SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3326-TRENTON PSYCH HOSP (DMHH)-CARPENTRY	400 +/-				7 7 7 7 7	M TU W TH F SAT SUN
	3343-TRENTON PSYCH-Machine Shop						M TU W TH F SAT SUN
	3363-TRENTON PSYCH HOSP (DMHH)-Transformer Vault						M TU W TH F SAT SUN
	3378-TRENTON PSYCH HOSP (DMHH)-Our House Well House						M TU W TH F SAT SUN
	3368-TRENTON PSYCH HOSP (DMHH)-Transformer Vault Drake						M TU W TH F SAT SUN
	3330-TRENTON PSYCH HOSP (DMHH)-Transformer Vault						M TU W TH F SAT SUN

TRENTON PSYCHIATRIC HOSPITAL OCCUPANCY DATA

IDN BLDG	BUILDING NAME	BLDG AREA (SF)	>10,000sf	>6,000sf	>1,000sf	# OF OCCUPANTS (STAFF AND RESIDENTS)	HOURS OCCUPIED (i.e. 7a-7p, 9-5, 24hrs. Etc)
	3394-TRENTON PSYCH HOSP (DMHH)-Transformer Vault						M
							TU
							W
							TH
							F
							SAT
							SUN
	3352-TRENTON PSYCH HOSP (DMHH)-Trans-Vault						M
							TU
							W
							TH
							F
							SAT
							SUN

FACILITY ENERGY PROFILE (REQUIRED SUMMARY FORMAT WITH SAMPLE DATA)

Energy Type (Primary ¹)	Annual Volume (with relevant units)	Energy Conversion Factor	Annual Energy Consumption (Site kBtu's)	Annual Energy Cost (\$)	Average Cost per Unit Volume	Average Cost per MMBTU	CO2 Conversion Factor	Equivalent CO2 Emissions (Metric Tons ³)
Electricity	7,000,000 kWh	3.412 kBtu/kWh	23,884,000	\$560,000	\$0.14/kWh	\$23.45	1.1 lb/kWh	1,995
Natural Gas	200,000 therms	100 kBtu/th	20,000,000	\$170,000	\$0.85/therm	\$8.50	120.6 lb/MMBTU	273
#2 Oil (Diesel) ⁶	3,000 gallons	138 kBtu/gal	414,000	\$5,400	\$1.80/gal	\$13.04	22.4 lb/gal	30
#4 Oil	3,000 gallons	144 kBtu/gal	432,000	\$5,010	\$1.67/gal	\$11.60	22.4 lb/gal	30
#6 Oil (LS)	3,000 gallons	144 kBtu/gal	432,000	\$5,010	\$1.67/gal	\$11.60	26 lb/gal	35
Propane	100 gallons	91.6 kBtu/gal	9,160	\$90	\$0.90/gal	\$9.83	12.7 lb/gal	1
Chilled Water ²	6,000 ton-hours	12 kBtu/ton-hr ⁴	72,000	\$900	\$0.15/ton-hr	\$12.50	TBD ⁵	TBD
Hot Water ²	15,000 CF	7.3 kBtu/CF ⁴	109,500	\$1,369	\$0.09/CF	\$12.50	TBD ⁵	TBD
Steam ²	80 Mlbs	1,000 kBtu/Mlb ⁴	80,000	\$1,216	\$15.20/mlb	\$15.20	TBD ⁵	TBD
			45,432,660	\$748,995			\$16.49	2,364

Total Annual Energy Consumption (Site kBtu)	45,432,660
Total Area of Facility Conditioned Space (sq. ft.)	250,000
Facility Energy Use Intensity (Site kBtu/sq ft)	182

¹ Should only list primary energy types for this summary (ex: including natural gas fuel for boiler but not the boiler steam production)

² Should only include secondary energy types in this table if they are purchased from a separate entity (ex: third party CHP supply)

³ For CO2 emissions, 2205 lbs = 1 metric ton

⁴ Actual energy conversion factors for secondary energy types to be determined by consultant based on relevant metrics (ex: temp, pressure, metered units, etc)

⁵ CO2 conversion factors for secondary energy types should be based on fuel and efficiency of provider, if known

⁶ When reporting #2 fuel oil or diesel, only count what is used for facility purposes. Do not include diesel consumption for vehicle fueling.

EXHIBIT 'D'

ENERGY CONSERVATION MEASURE SUMMARY (REQUIRED SUMMARY FORMAT WITH SAMPLE DATA)

(List in order of simple payback)

ECM No.	ECM Description	Electricity		Fuel/Other Energy		Water		O&M	Total Cost and Benefits							
		Annual Electricity Use Reduction (kWh)	Annual Electricity Cost Savings (\$)	Annual Fuel Use Reduction (MMBTU)	Annual Fuel Cost Reduction (\$)	Annual Water Savings (gal)	Annual Water Cost Savings (\$)	Annual O&M Cost Savings (\$)	ECM Gross Cost (\$)	Rebates or Incentives (\$)	Annual SREC or DR Revenue (\$)	ECM Net Cost (\$)	Total Annual Energy Reduction (MMBTU) ²	Total Annual Cost Savings (\$)	Annual CO ₂ Reduction (metric tons)	Simple Payback (years)
1	Water conserving fixtures	0	\$0	82	\$698	142,800	\$571	\$0	\$1,064	\$0	\$0	\$1,064	82	\$1,269	2	0.8
2	Lighting upgrade with sensors	536,230	\$75,072	0	\$0	0	\$0	\$9,525	\$160,000	\$17,060	\$0	\$142,940	1,830	\$84,597	268	1.7
3	VFD's and motors ¹	338,884	\$47,444	0	\$0	0	\$0	\$0	\$143,500	\$33,147	\$0	\$110,353	1,156	\$47,444	169	2.3
4	HVAC Controls Upgrade	10,887	\$1,524	3,579	\$30,422	0	\$0	\$25,000	\$336,000	\$0	\$0	\$336,000	3,616	\$56,946	200	5.9
5	Demand-Controlled Ventilation ¹	0	\$0	415	\$15,500	0	\$0	\$0	\$95,200	\$0	\$0	\$95,200	415	\$15,500	25	6.1
6	Transformer Upgrade	183,312	\$25,664	0	\$0	0	\$0	\$0	\$159,040	\$0	\$0	\$159,040	625	\$25,664	91	6.2
7	Solar (PV) System	80,000	\$11,200	0	\$0	0	\$0	\$0	\$525,800	\$0	\$48,000	\$525,800	273	\$59,200	40	8.9
8																
9																
		1,149,313	\$160,904	4,076	\$46,620	142,800	\$571	\$34,525	\$1,420,604	\$50,207	\$48,000	\$1,370,397	7,997	\$290,620	795	4.7

¹ ECMs should be summarized in a way that avoids overlap and double counting (ex: claiming the same electricity use reduction from VFDs and Demand-Controlled Ventilation)

² Should represent total energy reduction for each measure, expressed in million Btu's (MMBTU)

TRENTON PSYCHIATRIC HOSPITAL GENERAL CONTRACTOR REGULATIONS

1. Normal working hours are 7:30 am to 4:00 pm Monday through Friday.
2. Contractor vehicles or those used by employees of the contractors are subject to the parking and traffic regulations as they apply to Trenton Psychiatric Hospital, and are to be locked when unattended.
3. All employees of the contractors are to wear contractor/key card I.D. Badges issued by the maintenance office at all times. There is a \$25.00 per badge charge for any not returned at the completion of the job.
4. Any keys, needed by the contractor, will be issued by the maintenance office in quantities needed to permit access to the buildings(s). There is a \$25.00 per key charge for any not returned at the completion of the job.
5. All tools, materials and equipment are to be secured at the end of each business day. At no time are any of these items to be left unattended.
6. Each work area is to be cleaned at the end of every business day. All trash and debris will be removed from the site daily.
7. No workman is to fraternize with patients at any time. Do not give patients money, cigarettes, a light, matches, tools, and contraband of any kind. Do not accept anything from patients.
8. Always keep doors locked and always lock any door you use. Do not prop any door open at any time for any reason.
9. No alcoholic beverages or weapons are allowed on the Trenton Psychiatric Hospital grounds at any time.
10. No picture taking of any kind is permitted unless authorized by the Engineer in Charge of Maintenance.
11. All work is to be performed in a professional manner and must be approved by the Engineer in Charge or his designee.
12. Full compliance with the Safety Director at Trenton Psychiatric Hospital will be required during the course of the work, and follow all OSHA regulation.
13. Smoking is prohibited at this facility; Contractors should take measures to see that no one in their employ is smoking anywhere on TPH Grounds, Buildings, in vehicles or within 50 feet of the property.
14. The manner of dress of any employee while working at TPH shall be consistent with the role of a psychiatric hospital. Inappropriate clothing as follows, includes but is not limited to shorts, hemlines for dresses and skirts no more than (3) inches above the knees, sexually provocative clothing, and shirts or sweatshirts with graphic and/or language which is sexually provocative or offensive to any ethnic group.

Company Name: _____ DATE: _____

Print: _____ Sign: _____

Revised 11/12/11

EXHIBIT 'F'

ANN KLEIN FORENSIC CENTER CONTRACTOR REQUIREMENTS

Hospital Safety Policies:

- Policy 607: Traffic Regulations and Parking Plan - No parking on grass or in front of building. No contractor parking in employee parking lot.
- Policy 401: Right to Know - MSDS required for all chemical containing materials.
- Policy 335: Tobacco-free environment - No smoking while on the grounds/campus.
- Policy 807: Outside Contractors-
 - Must check-in/check-out daily with the Medical Security Department.
 - Abide by all OSHA/PEOSHA regulations, Life Safety Codes, NJ State Fire Codes.
 - Contractor is responsible to secure all vehicles and tools.
 - Must have Medical Security Officer(s) (or assigned escort) while in the secured area(s) of the property – numbers to be determined by location and area of work.
 - Check with the Maintenance Engineer prior to drilling into the building.
 - All lost or broken tools must be immediately reported to the Maintenance Engineer and the security escort.
 - Contractor employees, construction offices, vehicles, toolboxes, and lunch containers are subject to being searched.
 - While in the building the contractors must wear a Contractor ID tag and must sign in.
- Policy 806: Control of Tools - Tools that enter the building will be checked and must be accounted for at end of work day. A building search must be implemented immediately for all missing tools.

Administrative Requirements:

- Start time: To be determined.
- Sallyport Gate entrances must remain functional / accessible as it's the main access route for the Fire Department.
- Containers/dumpsters are permitted to stay overnight if they are covered and locked.
- Contractor may not use hospital facilities, to include restrooms. Contract may provide port-a-john(s) on site at approved location.
- No taking pictures without expressed permission of the hospital administration.
- Zero tolerance for alcohol and CDS. HSPD will be notified in event of abuse.
- Disputes/disagreements/issues will be resolved by the DPMC site supervisor.
- Employees must be dressed appropriately – must wear shirts, no obscenities.
- The hospital will not collect and remove contractor waste or refuse. Contractor responsible for waste removal.

EXHIBIT 'G'

Unit Costs for Energy Meters to be used in Energy Audit

Include any meters/sensors/dataloggers that may be required in the course of the audit

Utility Measured	Manufacturer	Model	Description	Install or Removal	Monthly Rental Rate (\$/ month)
Temperature			Sensor Logs Temperature and Humidity (only temperature data analysis is anticipated for this study)		
CO2 Levels			Sensor Logs CO2 Levels, Temp and Humidity (only CO2 and temperature data analysis is anticipated for this study)		
Occupancy & Light Sensor			Sensor logs Light On/Off and Occupancy		
Domestic Hot Water			Strap-On Ultrasonic Sensor logs water flow		
Water (Heating Hot Water or Chilled Water)			This meter is used if adequate strait run is available. Strap-On Ultrasonic Sensor Logs Water Flow		
BTU meter			Strap-On Ultrasonic Sensor logs water flow and temperature		
Hot or Chilled Water, 12" line			Add 20ft. of piping and necessary fittings to allow for a straight run for accurate measurements		
Hot or Chilled Water, 10" line			Add 20ft. of piping and necessary fittings to allow for a straight run for accurate measurements		
Hot or Chilled Water, 8" line			Add 20ft. of piping and necessary fittings to allow for a straight run for accurate measurements		
Hot or Chilled Water, 6" line			Add 20ft. of piping and necessary fittings to allow for a straight run for accurate measurements		
Hot or Chilled Water, 4" line			Add 20ft. of piping and necessary fittings to allow for a straight run for accurate measurements		
Steam 12" line			Insertion flow meter. Assume installation needs 20ft of straight pipe, 2 elbows, 2 tees and 2 flanges for meter		
Steam 10" line			Insertion flow meter. Assume installation needs 20ft of straight pipe, 2 elbows, 2 tees and 2 flanges for meter		
Steam 8" line			Insertion flow meter. Assume installation needs 20ft of straight pipe, 2 elbows, 2 tees and 2 flanges for meter		
Steam 6" line			Insertion flow meter. Assume installation needs 20ft of straight pipe, 2 elbows, 2 tees and 2 flanges for meter		
Steam 4" line			Insertion flow meter. Assume installation needs 20ft of straight pipe, 2 elbows, 2 tees and 2 flanges for meter		
Electric kW meter, 3-phase, 480volt 100amps			Split core CT's, 30-day data storage min., 15-minute interval measurements		
Electric kW meter, 3-phase, 480volt 200amps			Split core CT's, 30-day data storage min., 15-minute interval measurements		
Electric kW meter, 3-phase, 480volt 400amps			Split core CT's, 30-day data storage min., 15-minute interval measurements		
Electric kW meter, 3-phase, 480volt 800amps			Split core CT's, 30-day data storage min., 15-minute interval measurements		

List below and identify any additional meters as may be required (Attach 2nd sheet if necessary)

* Utility Measured = water, steam, electricity, occupancy etc.

EXHIBIT 'H'